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ABSTRACT

The making of a decision implies a choice between competing alternative solutions. In a decision-making context including multiple criteria, the criteria (or their related variables) are placed in relation to each other. This provides a comparison to some fixed point or origin, reducing the problem to one which can be solved by optimization as in the single criterion condition. It is also possible to conceive an "ideal" solution either as an independent entity or as a composite of the "best" aspects of all the criterion variables. The conceptualization of the "ideal" in a set of alternatives under decision is important because the addition of an extraneous alternative into the decision set can expand the decision boundary, thereby changing the location of the ideal point and reordering the alternatives relative to the ideal point. The demonstration that a non-optimal alternative can be made optimal by the addition of a new alternative into the strategy set (Ideal Displacement) can be made. For school evaluators and decision makers, these abstract issues become of pragmatic concern because the process by which alternatives are developed, weighted, and selected will have a profound impact on the quality of the decision made. (BW)

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EVALUATOR CONCERNS ARISING FROM IDEAL DISPLACEMENT.

If education is to benefit from our expanding knowledge base, then the dissemination of new concepts to the operational domain of educational evaluation is necessary. This is especially true with respect to decision making. If the school administrator is to make effective decisions in an environment where continuous change necessitates an expanding capacity for decision, then provision must be made for school-based applications of planning theory. This paper attempts to address a new planning concept, Ideal Displacement, and to deal with the implications of this concept for the school evaluator.

The making of a decision implies a choice between competing alternative solutions. This defines the existence of two or more alternatives. In fact, the development of these alternative solutions is a central theme both in evaluation and in decision making. Rationalism is based on this idea. The on-going process of alternative development is vital to any sound decision process.

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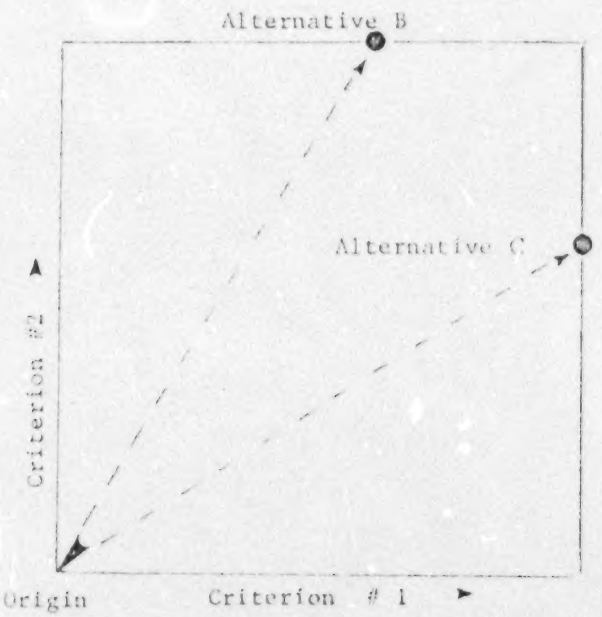
Decisions between generated alternatives can be made in a single criterion

context; select the student with the highest GPA: Student A (GPA = 2.5) or Student B (GPA = 3.0). This is a decision only in the purest sense. The selection process is, in reality, a sorting function. With the addition of further criteria such as highest GPA and highest Statistical Aptitude Test score, the problem of selection becomes more complex and a Multiple Criterion Decision (MCD) must be made. Are the criteria to be used in an MCD judgementally equal in the decision? The classical approach to MCD is to develop weighting factors and "objective functions."

The criteria (or their related variables) are then placed in relation to each other. This provides a comparison to some fixed point or origin. In a sense, this origin and the alternatives provide the means of establishing a decision boundary which can be illustrated as follows (Note: Alternatives B and C are equivalent in this scheme):

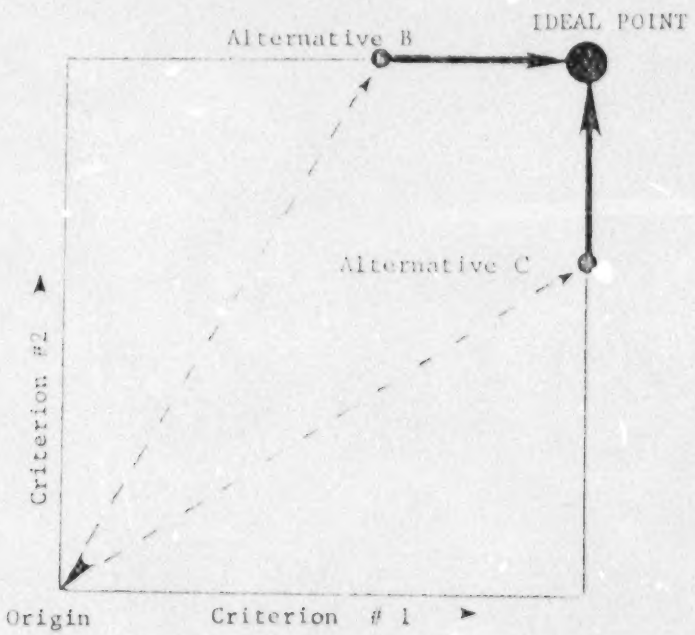


Decision Boundary

These are attempts to build a single value or score which represents the

net interaction of the criteria variables. This, of course, reduces the problem to one which can be solved by a sorting or bounding procedure (optimization) as in the single criterion condition. The alternative closest to the fixed point origin is chosen as the best solution. This procedure works well when the "best conceivable" solution exists as a real solution within the set of feasible solutions.

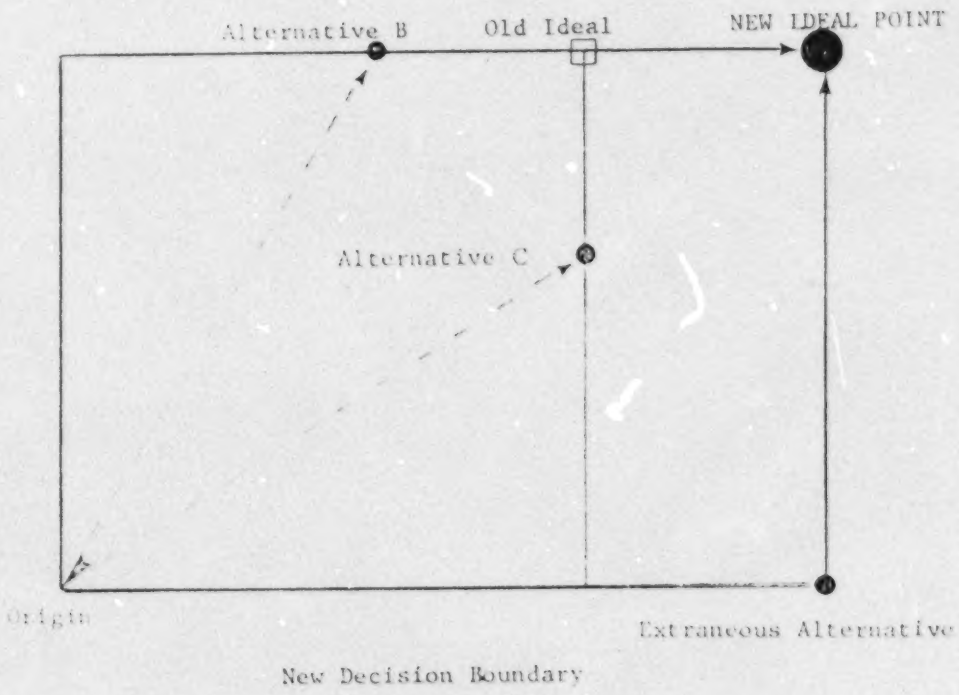
It is, however, quite possible to conceive an "ideal" solution either as an independent entity or as a composite of the "best" aspects of all the criterion variables. Note that in the diagram above one can extend the axis of each criterion, which represents the maximum value for that axis, creating an ideal alternative as a combination of the best qualities known. The ideal point is illustrated below and, while abstract, does provide a competing reference point to the origin.



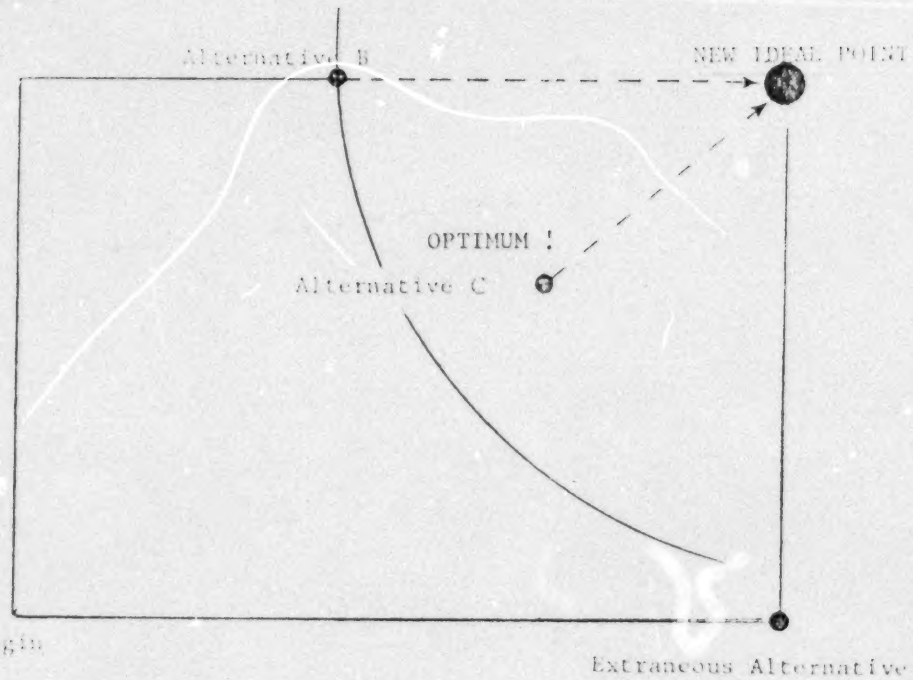
Decision Boundary

In such cases the ideal solution may not be attainable. The

conceptualization of the "ideal" in a set of alternatives under decision is assuming importance in relation to traditional optimization solution strategies. The reason for this increasing importance can be found by observing that the addition of an extraneous alternative into the decision set can expand the decision boundary thereby changing the location of the ideal point and reordering the alternatives relative to the ideal point as illustrated below.



The demonstration that a non-optimal alternative can be made optimal by the addition of a new alternative into tne strategy set (Ideal Displacement) can be made as illustrated below.



This places the constructs of such classical approaches as utility theory and linear programming, which rest on Arrow's axiom of the independence of irrelevant alternatives, in question.

For the evaluator these abstract issues become of pragmatic concern. The skillful proposal of an "alternative" is an effective political tool for displacing a generally preferred solution. The normal operating procedure of a committee is such that the priority order of the set of feasible alternatives is unstable due to the haphazard introduction of new alternatives. Decisions made in this context are questionable.

The process by which alternatives are developed, weighted, and selected will have a profound impact on the quality of the decision made. New alternatives, added after the selection procedures have been initiated, make all past analysis suspect. The requirement for extensive alternative searching, prior to selection, becomes paramount. Evaluators and decision makers, as individuals or in committee, must be aware of the condition of "Ideal Displacement" and guard against procedures which create the condition.

Bibliography

Evaluator Concerns Arising from Ideal Displacement

Arrow, K.J., Rational Choice Functions and Orderings, Economica, 26, 1959, 121-127.

Baumgartner, T, T.R. Burns, P. DeVille and L.D. Meeker, A Systems Model of Conflict and Change in Planning Systems with Multi-Level, Multiple-Objective Evaluation and Decision Making, General Systems Yearbook, 1975, 167-183

Ritzman, L., J. Bradford, and R. Jacobs, A Multiple Objective Approach to Space Planning for Academic Facilities, Management Science, Vol. 25, no. 9, 1979, 895-906.

Roy G. G., A Man-Machine Approach to Multicriteria Decision Making, International Journal of Man-Machine Studies, Vol. 12, no. 2, 1980, 203-215.

Zeleny, M., Multiple Criteria Decision Making, New York, McGraw-Hill, 1982.